













# WELCOME TO CHEMISTRY

## CHAPTER ONE INTRODUCTION



# *SECTION 1.1 Chemistry*



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### What is Chemistry?

Chemistry is the study of the composition of matter and the changes that matter undergoes.

Matter: Anything that has mass and takes up space

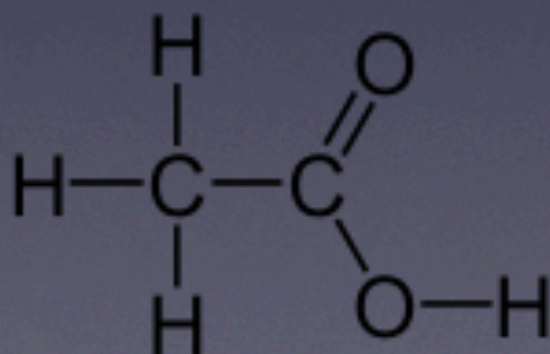
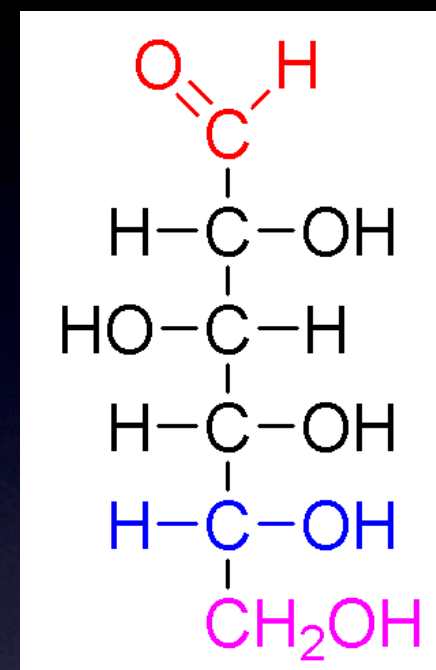
What does this mean?...

that's right... chemistry has to do with  
**everything!**



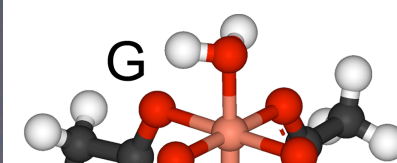
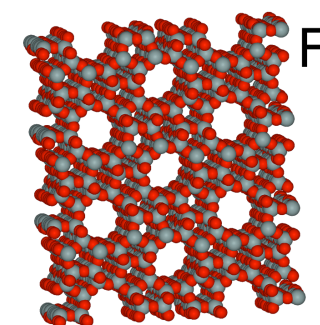
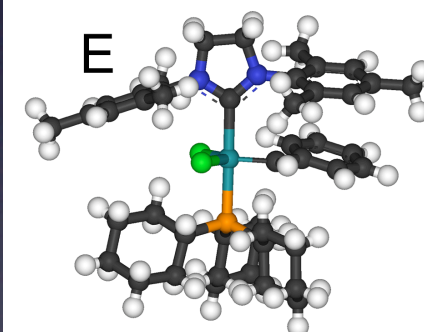
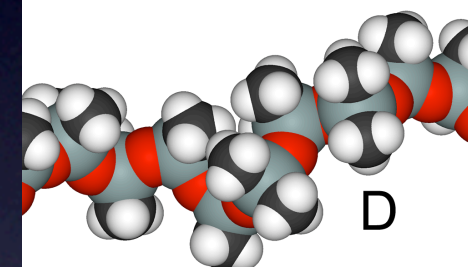
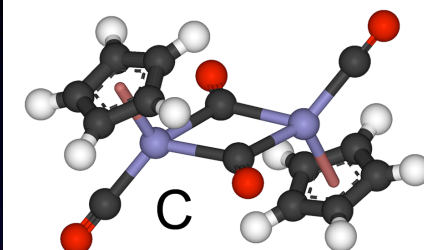
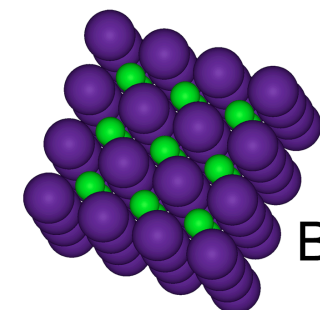
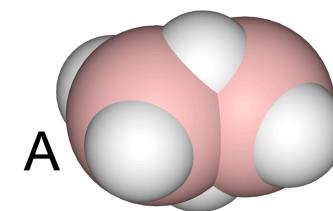
# AREAS OF STUDY:

**Organic chemistry:** Study of all chemicals containing carbon  
- includes ALL living things



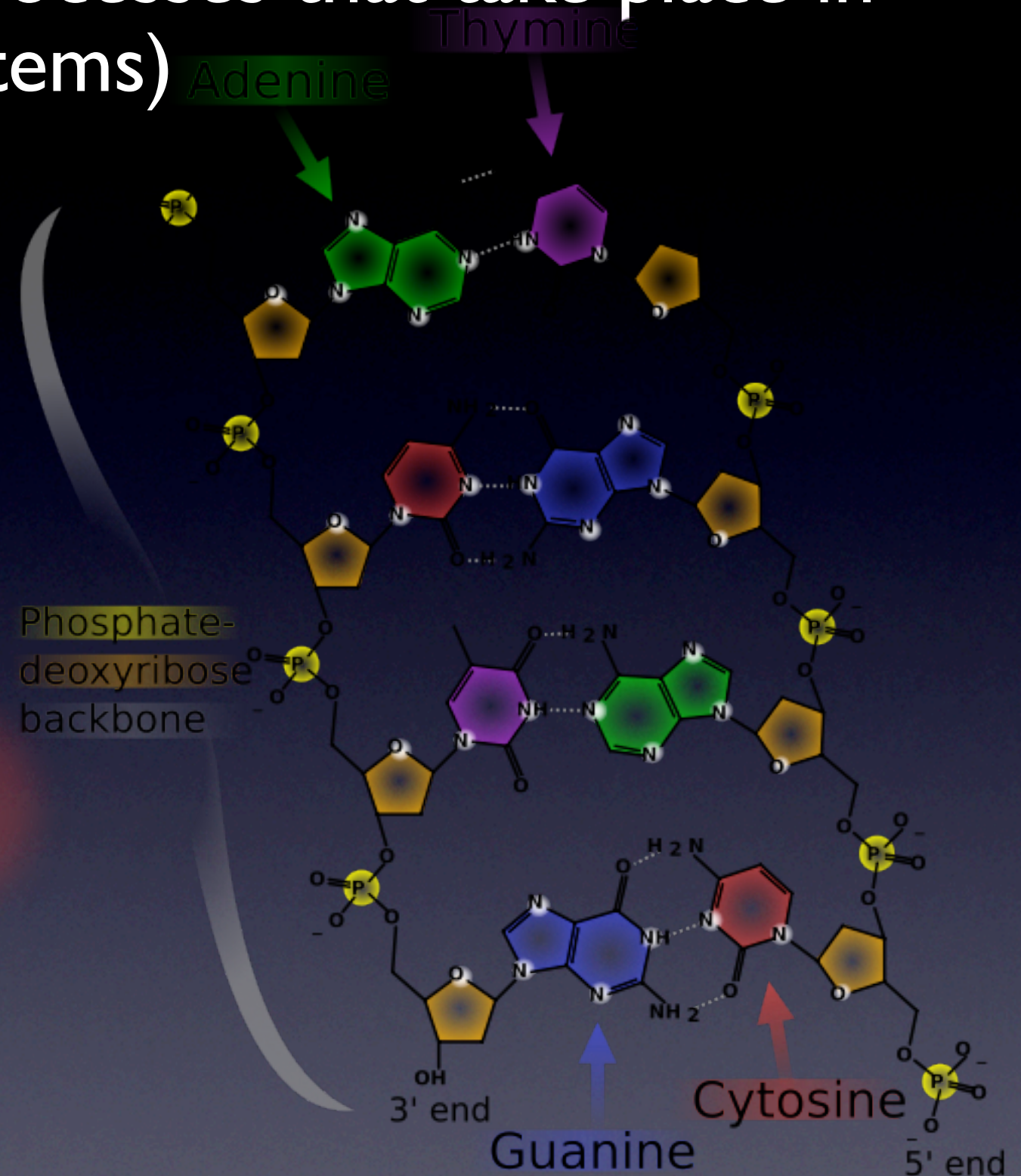
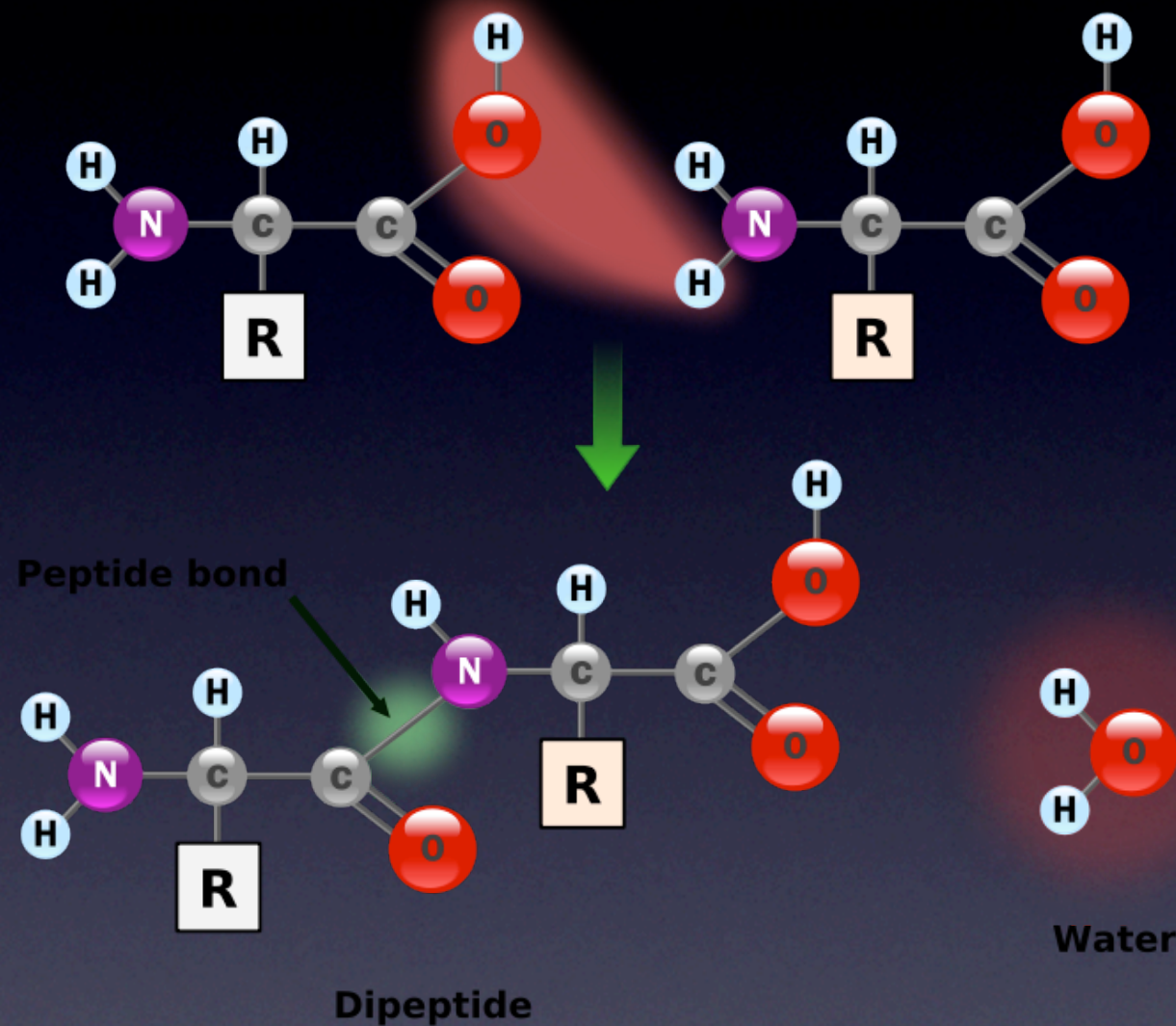


**Inorganic chemistry:** study of all chemicals that do not contain carbon... ex: NaCl, Au



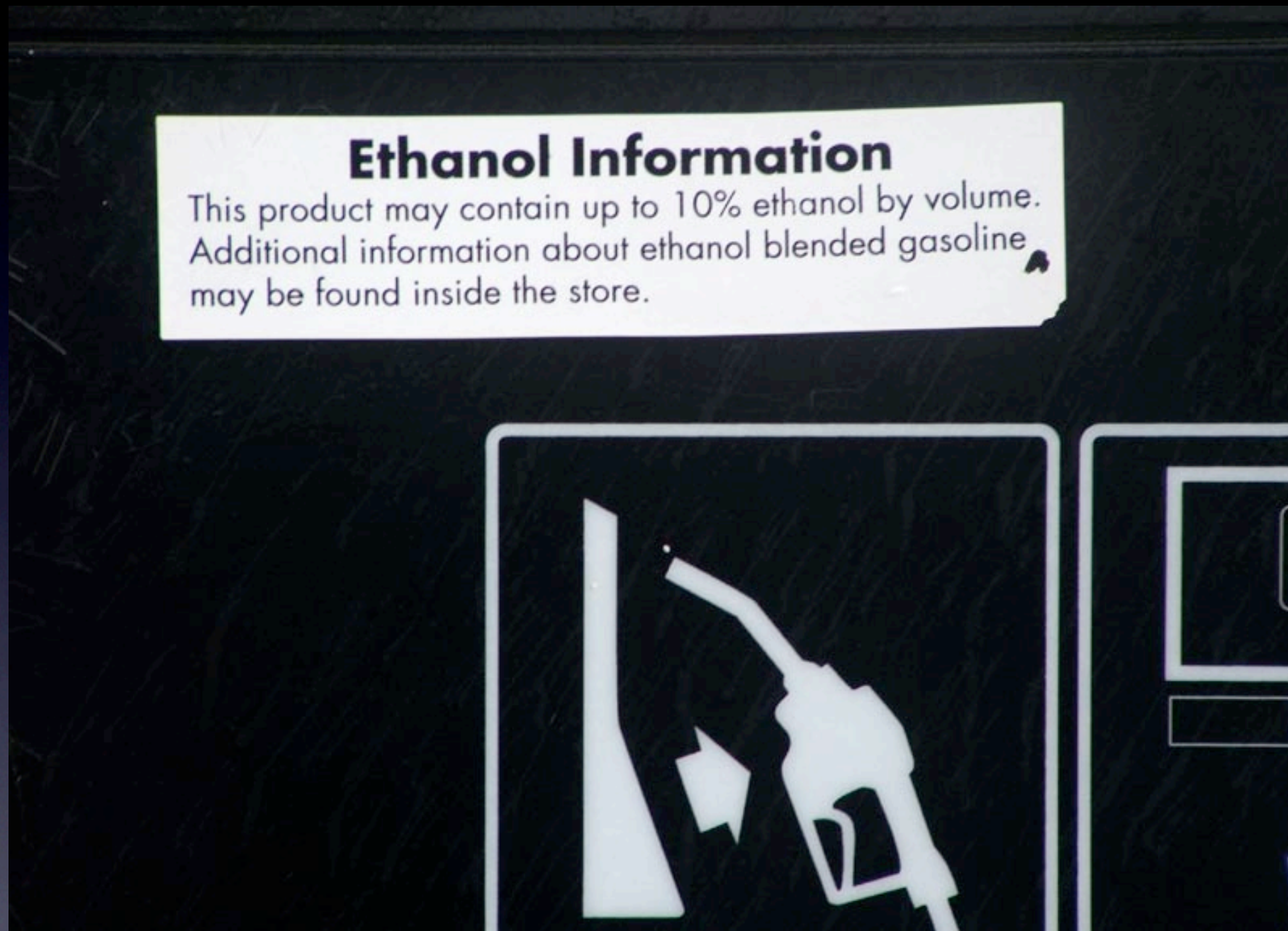


**Biochemistry:** study of processes that take place in organisms (ex: body systems)





**Analytical chemistry:** study that focuses on the composition of matter (ex: % sucrose in soda)





**Physical chemistry:** study of mechanisms, rate, and energy transfer occurring during changes of matter









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physical chemistry







# Pure Chemistry:



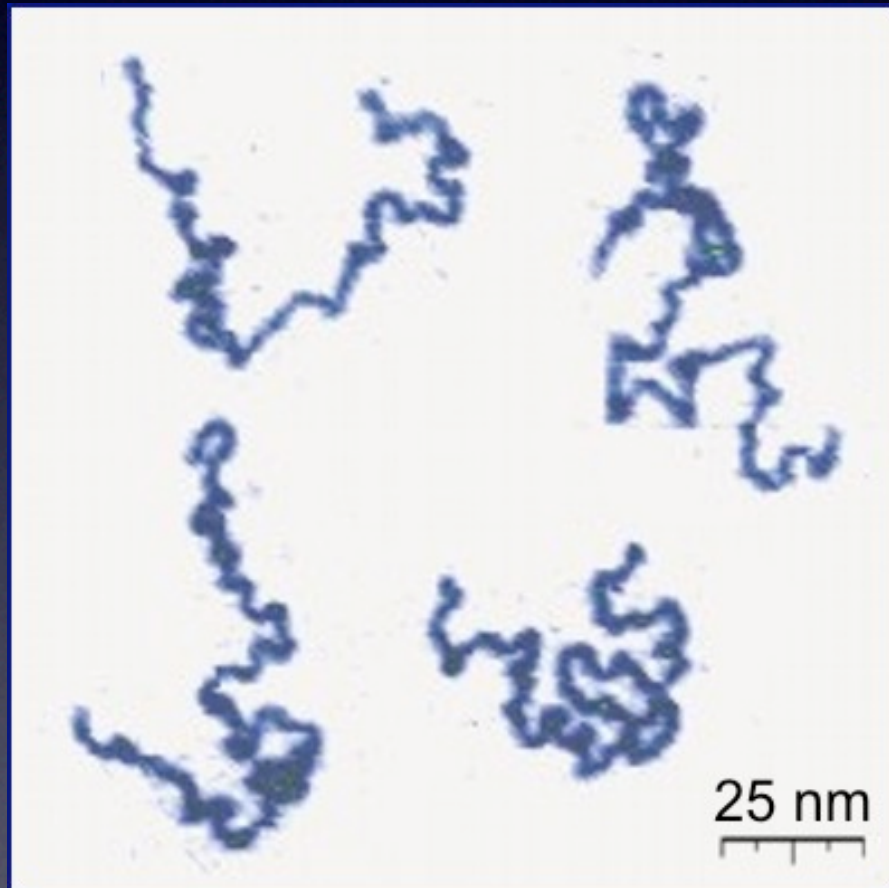
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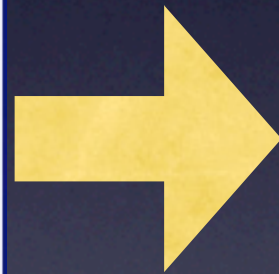
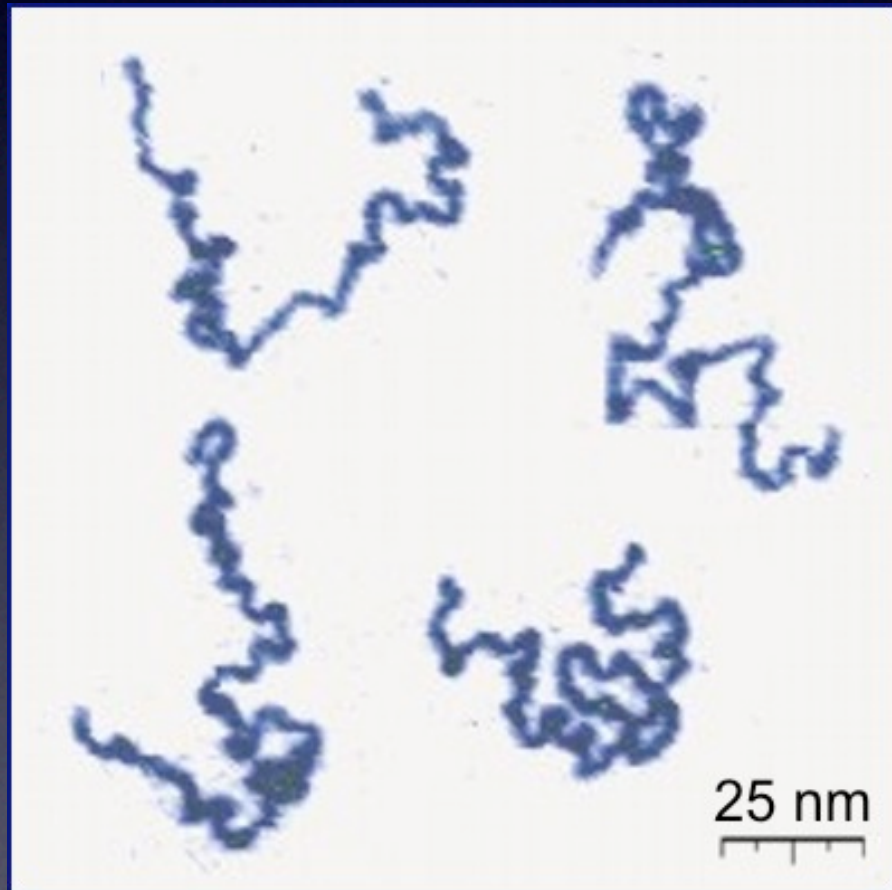
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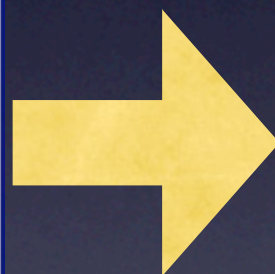
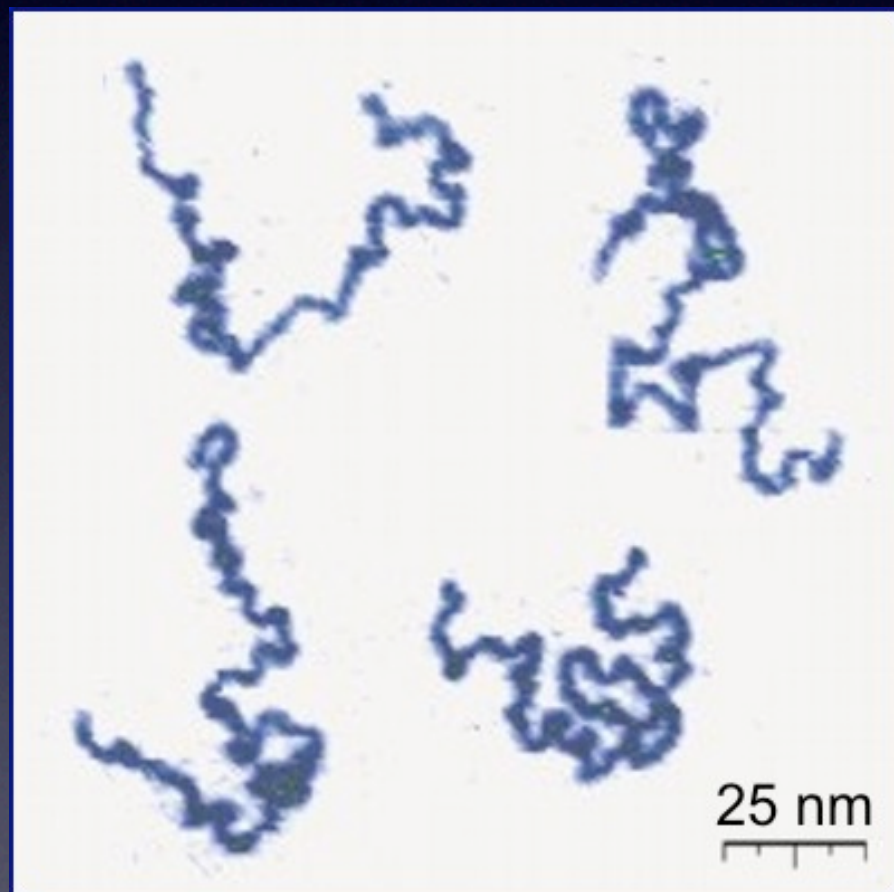
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**BAYER**  
PHARMACEUTICAL  
PRODUCTS.

Send for  
samples and  
Literature to

**ASPIRIN**  
*The substitute for  
the salicylates*

**PROTARGOL**  
*The silver-protein*

**QUINALGEN**  
*The an-typhoid*

**HEROIN**  
*The sedative for  
coughs*

**LYCETOL**  
*The uric acid solvent*

**SALOPHEN**  
*The antirheumatic and  
antineuralgic*

**EUROPHEN**  
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**HEROIN-HYDROCHL**  
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**ANSTOL**  
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**GUACOL**  
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**PIPERAZINE**  
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**SOMATOSE**  
*The an-typhoid*

**SYCOSE**  
*The an-typhoid*

**PHENACETIN**  
*The an-typhoid*

**TRIONAL**  
*The an-typhoid*

**FERRO-SOMATOSE**  
*The an-typhoid*

**HEMICRANIN**  
*The an-typhoid*

**SULFONAL**  
*The an-typhoid*

**IODOTHYRINE**  
*The an-typhoid*

**FARBENFABRIKEN OF  
ELBERFELD CO.**

**40 STONE ST  
NEW YORK.**



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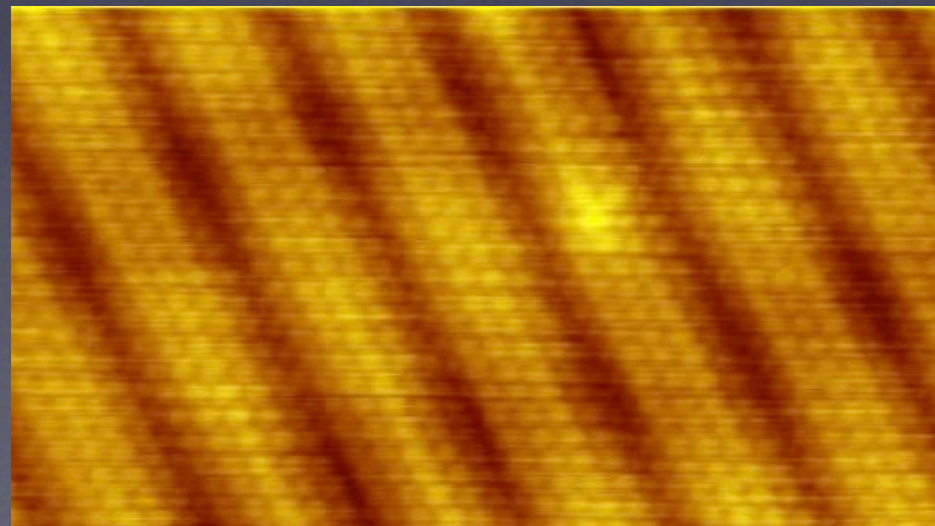


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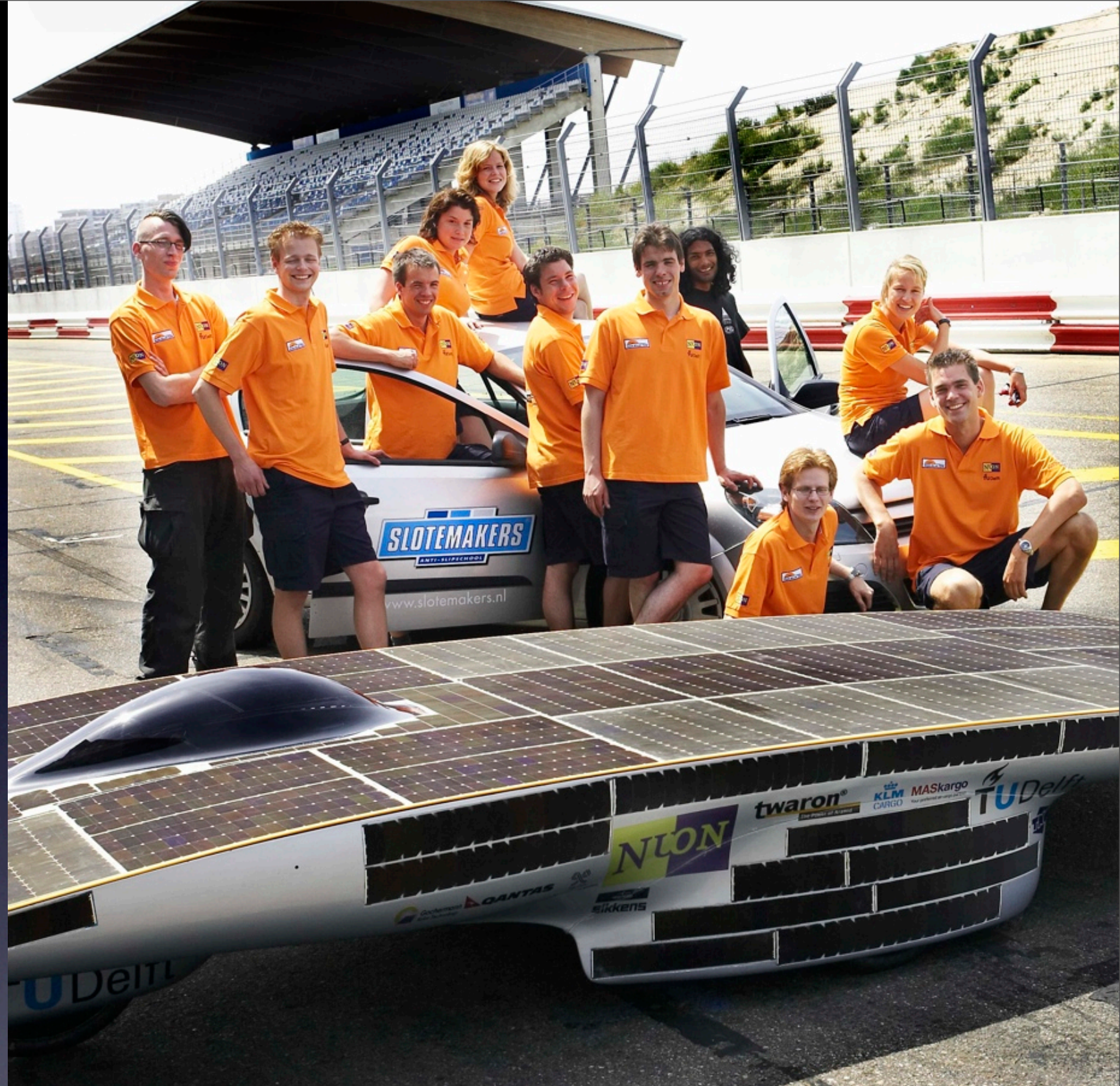
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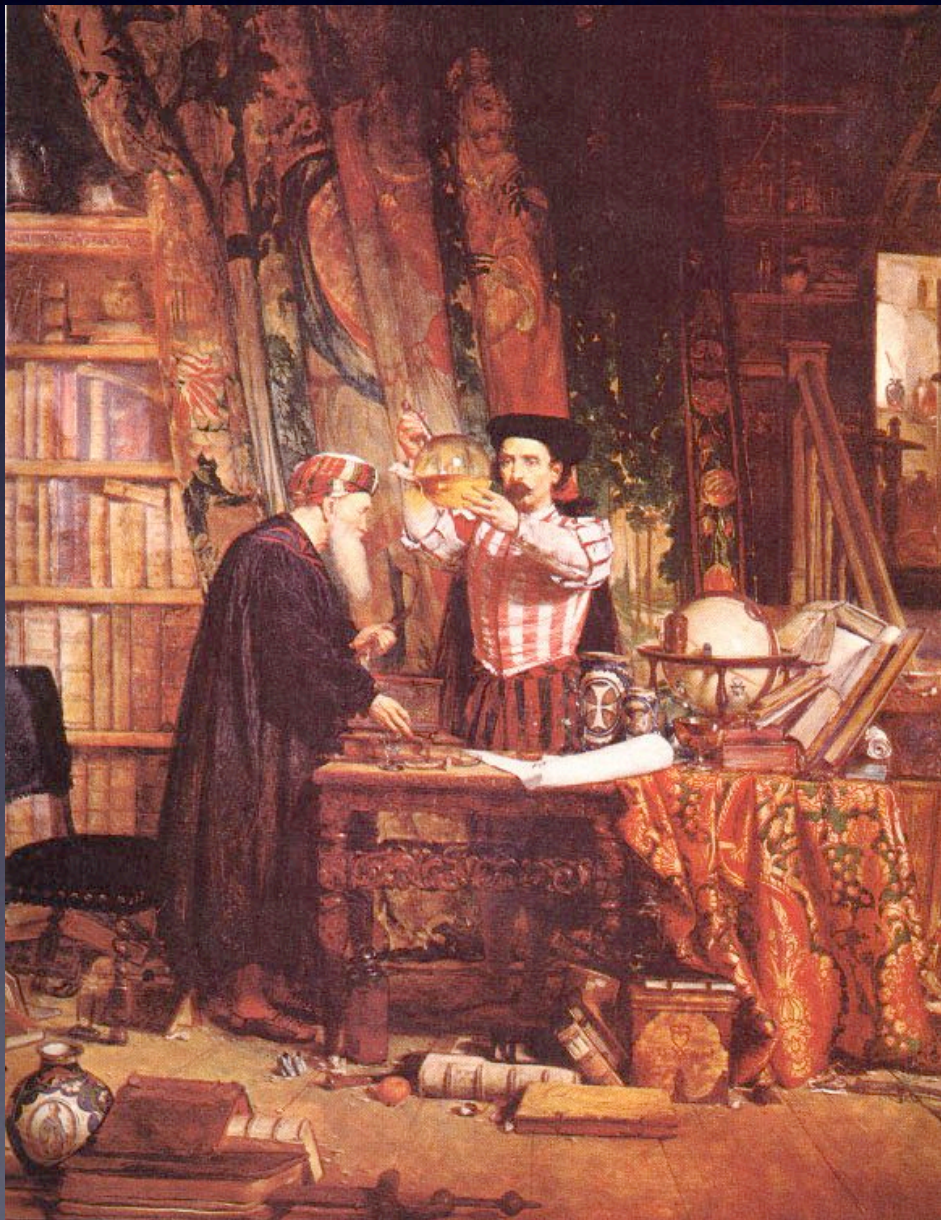
## Section 1.3 Thinking like a scientist!

*Chemistry* comes from the word *alchemy*:

Alchemists' goals:

Turning common metals into gold  
Finding the Philosopher's Stone, or  
*the elixir of life*

*to bring together and pull apart*



Nicholas Flamel was a famous alchemist in the 1300's. He supposedly found the *Philosopher's Stone* and became immortal.



Alchemists developed the tools and techniques for working with chemicals, but did not provide any logical explanations for the changes in matter they observed.

**T**Ake reddish rich Virgin Earth in ♀, impregnate it with ☉, ☿, serene and dew, till the end of *May*: Then imbibe sprinklingly with dew gathered in *May*, and dry in ☉, expose all Night to the ☿ and Air, securing it from Rain. Still when it is dry, imbibe and turn the Earth often. Continue this till ☿mation. The hot ☉ (especially in the Dog-days) will make a pure Salt shoot up, which mingle back into the Earth, by turning it all over. Then distill by graduated △ as *A. F.* forcing all the Spirits

An Explication of the Characters which are used in this Book.

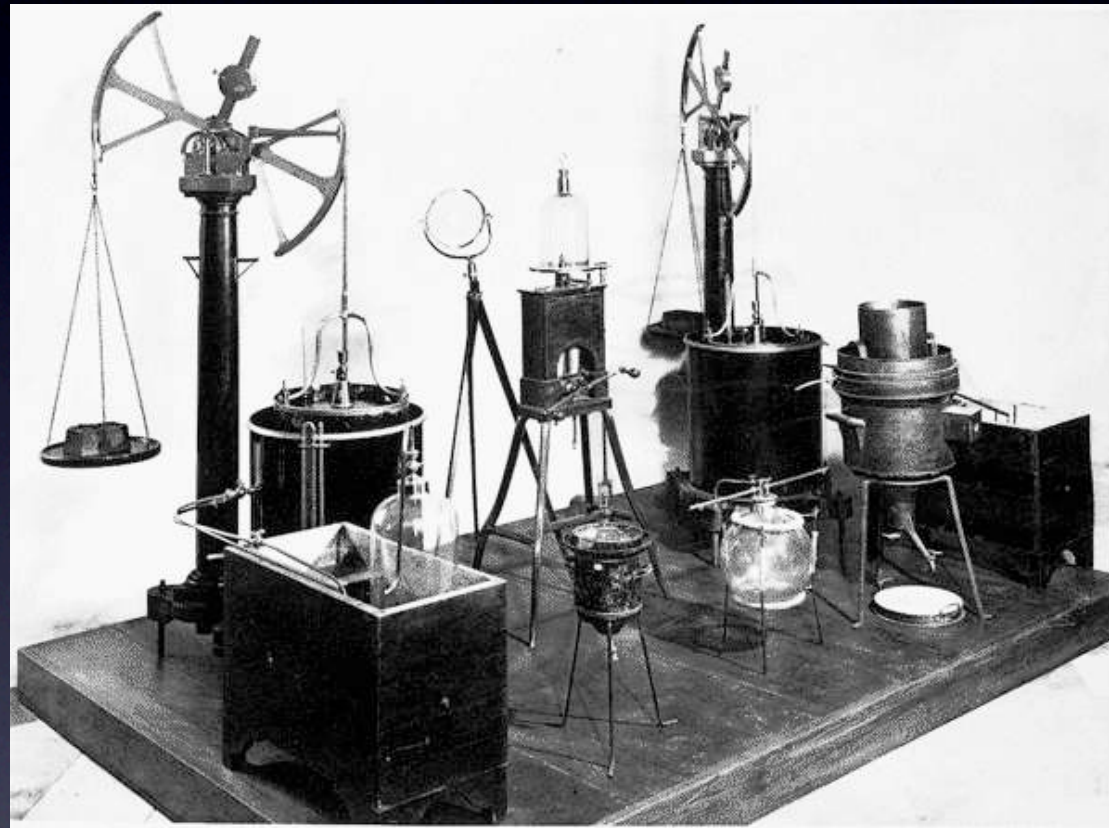
☉ *Gold.*  
 ☿ *Silver.*  
 ♂ *Iron.*  
 ♀ *Mercury.*  
 ♃ *Jupiter.*  
 ♀ *Venus.*  
 ♄ *Lead.*  
 ♂ *Antimony.*  
 ✱ *Sal armoniac.*

*A. F. Aqua Fortis.*  
*A. R. Aqua Regis.*  
*S. V. Spirit of Wine.*  
 ☿ *Sublimate,*  
 ☿ *Precipitate.*  
 ☿ *Amalgama.*  
 ▽ *Water.*  
 △ *Fire.*



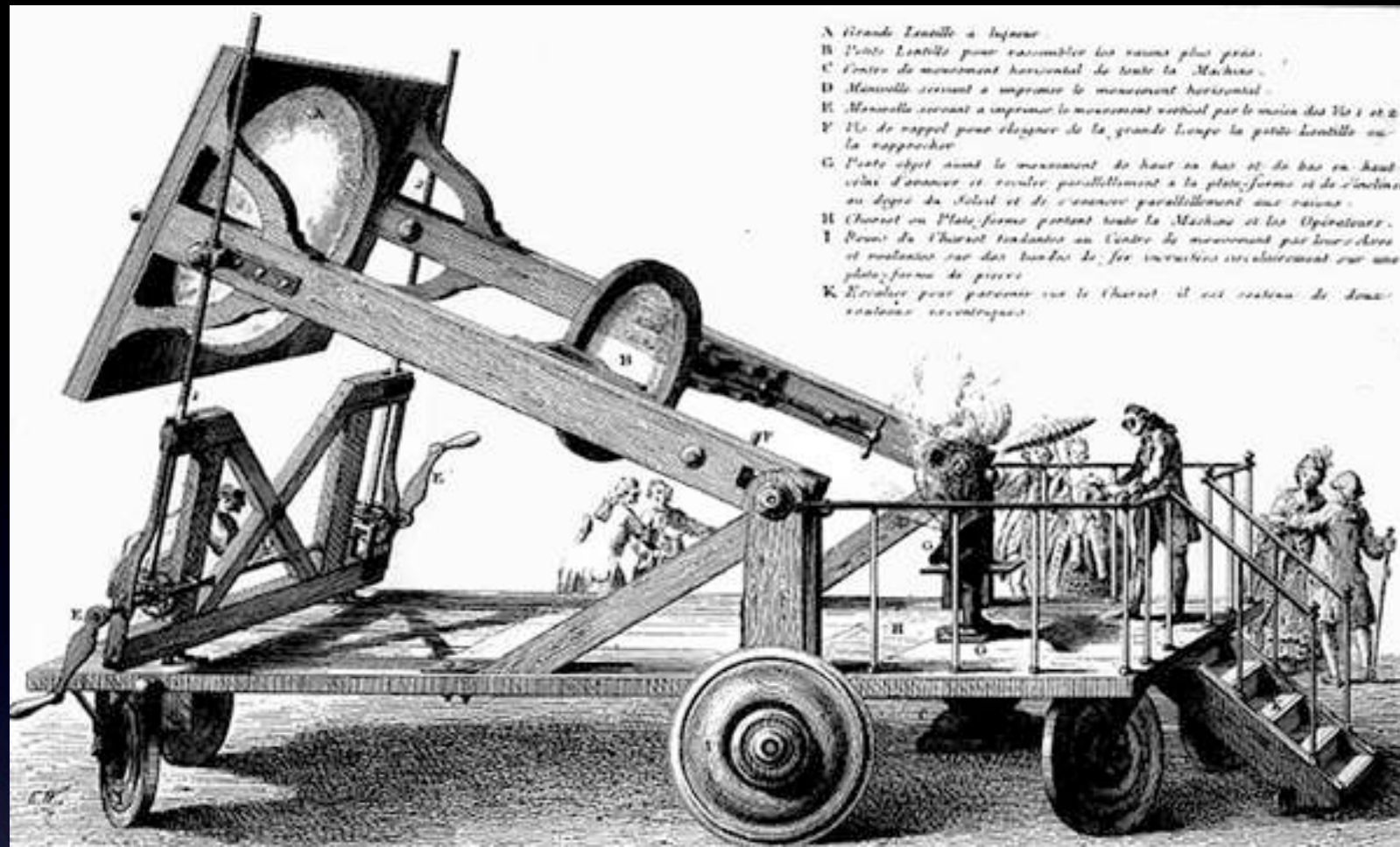
1700's: Chemistry was transformed from a science of observation to a science of measurement.

*Antoine Lavoisier* - father of modern chemistry



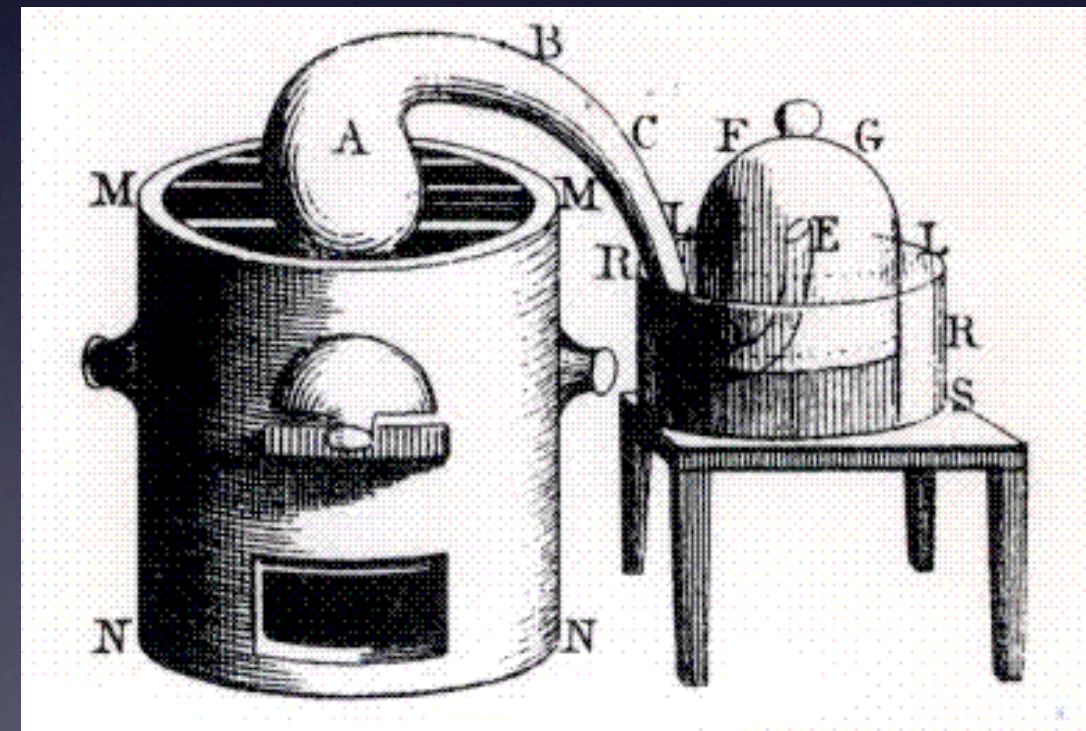
Lavoisier developed many instruments that could take precise measurements.



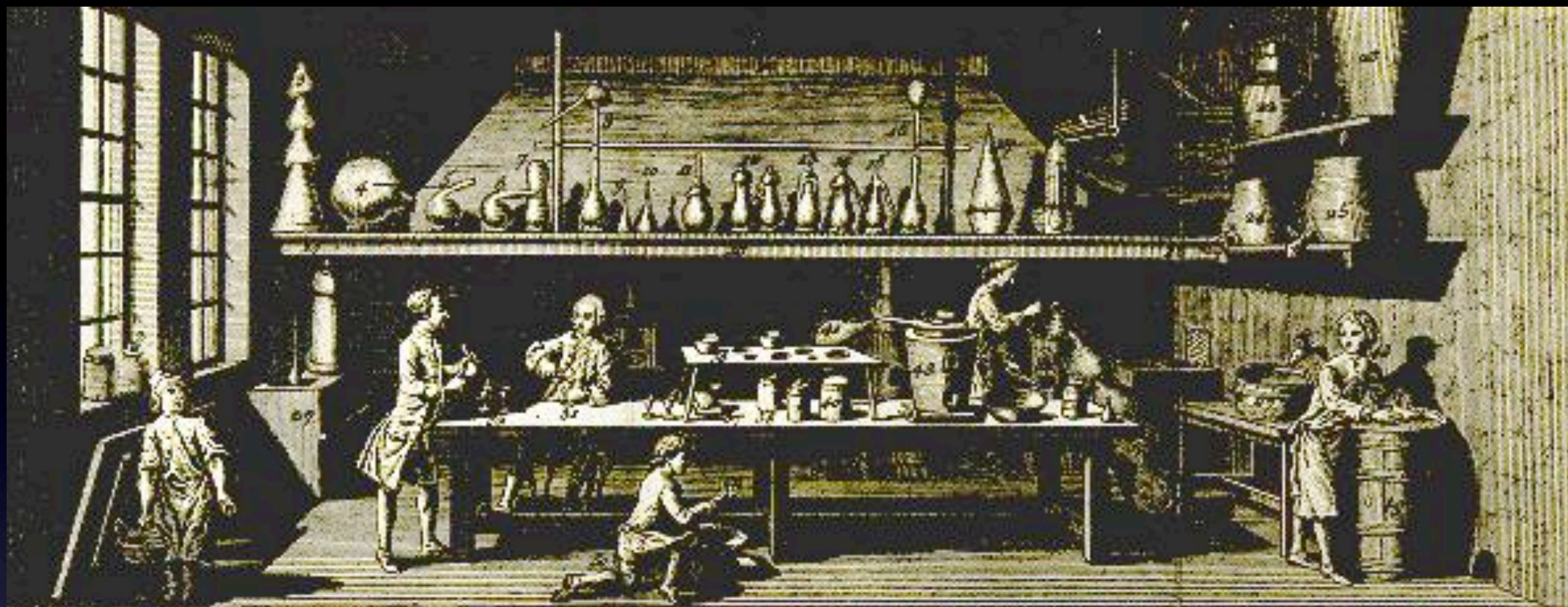


Lavoisier's wife sketched his equipment and many experiments, took notes, and translated texts for him.

He is credited with discovering oxygen (which is controversial). His apparatus that helped him discover oxygen and nitrogen in air.





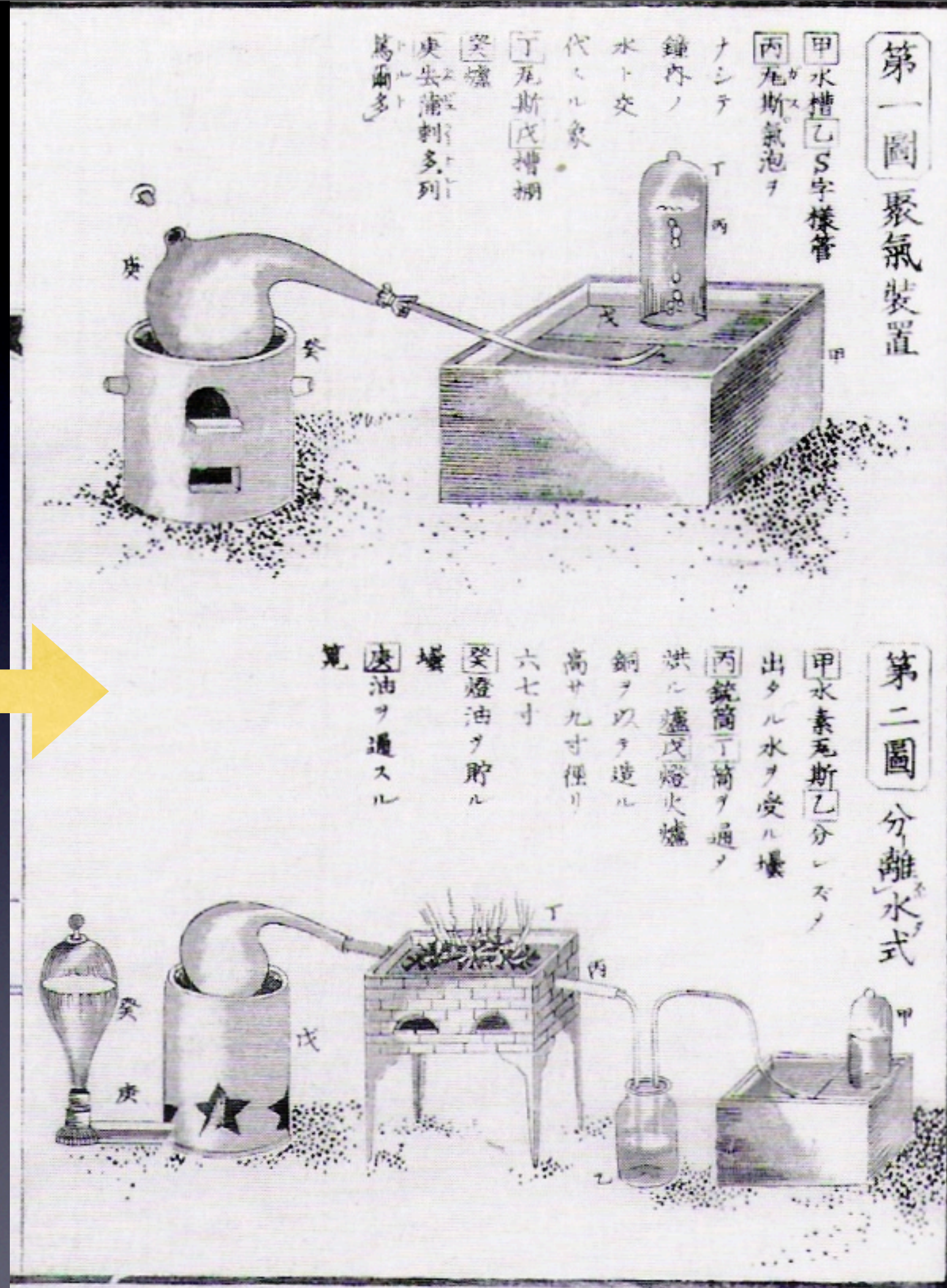


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Lavoisier was beheaded in 1794 because he was also a tax collector.

Lavoisier's work later became world-renowned. Here is a Japanese translation of his experiments.









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A good theory can be used to make predictions.



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Theories are **extremely** well-tested, but can be modified as new evidence is obtained.